

phase is darker olivaceous below, with a smaller and white spot crossed by vein 5; the intermediate phase does not, however, differ in the same way from the corresponding phase of *H. andamana*, so that I am not certain of the constancy of this difference. On the upper surface the outer border extends further on to the costal margin of the primaries than in *H. andamana* and is considerably broader, black, and sharply defined from veins 3 to 7 on the secondaries.

Sumatra (*Fawcett and Sachs*). Two males, B. M.

58. *Huphina remba*.

Pieris remba, Moore, Cat. Lep. E. I. C. i. p. 75 (1857).

Huphina liquida, Swinhoe, Ann. & Mag. Nat. Hist. ser. 6, vol. v. p. 361 (1890).

Mussourie, Mahableshwar, Mysore, Canara, Ceylon. B. M.

H. liquida is a male of the wet phase; the type is a male of the intermediate phase, rather browner below than Col. Swinhoe's type; and "*H. liquida* ♀" is a male of the dry phase, in which the apex of the primaries and the secondaries become sandy greyish.

The preceding species lead on naturally to *Udaina cynis*, in which the wet phase (*U. Pryeri*, Dist.) has the basal area of the secondaries and a slender bar crossing the cell on the under surface olivaceous. Although hitherto we have not received this phase from Malacca, we have the intermediate phase, in which the basal area of the secondaries is grey below, from Malacca, and we have the extreme dry phase (*U. cynis*) in the Hewitson collection from Borneo. I therefore have not the least doubt of the specific identity of the two forms. It is possible, as I have already suggested, that this species may be the true *Papilio monuste* of Linnæus; but, as the type is lost, this point can never be definitely settled.

XXXIII.—*List of Fishes collected during the Peary Auxiliary Expedition, 1894.* By OTTO HOLMQVIST, of the Zoological Institute, Lund, Sweden.

THE Peary Auxiliary Expedition offered but few opportunities for collecting sea-animals. Dr. A. Ohlin, the zoologist of the expedition, mentions* only seven trawling-stations,

* "Zoological Observations during the Peary Auxiliary Expedition,

situated for the most part in Inglefield Gulf or in the neighbourhood of that bay, between 77° and 78° N. lat. Fishes were obtained in a comparatively great number of both species and individuals in no less than four of these localities.

The following table shows the conformation of the localities in question, the distribution of species, and the date of capture:—

Murchison's Sound.—Depth 45 fathoms; bottom rocky and muddy.
July 29.

| | Specimens. |
|-------------------------------------|------------|
| <i>Icelus hamatus</i> | 38 |
| <i>Eumicrotremus spinosus</i> | 1 |
| <i>Gymnelis viridis</i> | 1 |
| <i>Lycodes Lütkenii</i> | 1 |
| <i>Gadus saida</i> | 1 |
| | — |
| Five species | 42 |

Inglefield Gulf.—Depth 25 fathoms; bottom rocky and muddy.
August 3.

| | Specimens. |
|--|------------|
| <i>Phobeter ventralis</i> | 3 |
| <i>Icelus hamatus</i> | 61 |
| <i>Centridermichthys uncinatus</i> | 6 |
| <i>Triglops Pingelii</i> | 1 |
| <i>Eumicrotremus spinosus</i> | 20 |
| <i>Gymnelis viridis</i> | 7 |
| <i>Lycodes Lütkenii</i> | 1 |
| | — |
| Seven species | 99 |

Neighbourhood of Cape Faraday.—Depth 5 fathoms; bottom sandy.
August 7.

| | Specimens. |
|-------------------------------|------------|
| <i>Liparis lineatus</i> | 13 |
| <i>Gadus saida</i> | 1 |
| | — |
| Two species | 14 |

Neighbourhood of Northumberland Island.—Depth 20 fathoms;
bottom rocky. August 13.

| | Specimens. |
|--------------------------------|------------|
| <i>Triglops Pingelii</i> | 1 |
| <i>Icelus hamatus</i> | 2 |
| | — |
| Two species | 3 |

1894: Preliminary Report by Axel Ohlin, Zoologist of the Expedition," in 'Biologisches Centralblatt,' Bd. xv. no. 5, pp. 162-163, figs. 1 & 2, and pp. 171-172.

To this list may be added two small fishes, the state of preservation of which, however, renders them indeterminable: one was captured with the surface-net in Inglefield Gulf, the other was obtained in the trawl off Northumberland Island. Both seem to belong to the same species, but are certainly different from any other species collected during the expedition.

As shown by this list, the locality marked Inglefield Gulf has been, beyond all other places, the most fruitful in results. Not less than seven species, represented by ninety-nine individuals, were obtained at this station. This circumstance may depend partly on the fact that this locality has been trawled twice, while at each of the other stations but one dredging was performed (as communicated to me by Dr. Ohlin).

The station of Murchison's Sound was situated "just where a river from a recedent glacier was flowing out into the sea, the water being here, to a considerable distance from the shore, very brackish"*. The occurrence in this place of purely marine forms, such as *Eumicrotremus spinosus* and *Lycodes Lütkenii*, shows, however, that the water was of a normal saltness at the bottom.

The material obtained by the dredge necessarily affords a very imperfect idea of the fish-fauna, the trawl-net hardly being able to catch other than slow-swimming bottom-species. Apart from this circumstance, the fish-material of the expedition may be considered very satisfactory, as is clearly shown in comparison with former arctic expeditions. The 'Dijmphna-Togt' was among the most fruitful in results. This expedition achieved not less than 190 dredgings in various parts of the Kara Sea, amongst which only 28 trawlings produced 170 specimens; these represented 11 species. Nares's expedition executed a great number of trawlings off North-western Greenland on a wide area between 78° and 83° N. lat., but obtained only 23 marine fishes, belonging to 7 species. During the Peary Auxiliary Expedition but a few limited dredgings were effected; yet no less than 9 (10) species of fishes were obtained, represented by 158 (160) specimens: besides which a number of Cottid fishes were thrown away through lack of preservative material, as I am informed by Dr. Ohlin. Comparatively speaking, this result is much greater than that of the 'Dijmphna' Expedition—nay, in proportion to the number of trawlings it probably is the most considerable product that any previous arctic expedition has afforded.

* Ohlin, *l. c.* p. 171.

Besides the purely marine species above mentioned, 13 specimens of *Gasterosteus aculeatus* were caught on the beach at Godhavn; including these, the total number of fishes obtained by the Expedition amounts to 171 (173) specimens, distributed among 10 (11) species.

Phobctor ventralis, Cuv. & Valenc.

Cottus ventralis, Cuvier & Valenciennes, Hist. nat. des Poissons, t. iv. p. 194.

Phobctor tricuspis, H. Kröyer, Naturhist. Tidsskrift, 2den Række, 1ste Bind, p. 263.

Acanthocottus patris, H. R. Storer, "Observations on the Fishes of Nova Scotia and Labrador," &c., Boston Journal of Natural History, vol. vi. p. 250, pl. vii. fig. 2.

Gymnacanthus pistilliger, R. Collett, The Norwegian North-Atlantic Expedition, 1876-78, Zoology, Fishes, p. 26.

This species is represented by three specimens (one male and two females) from Inglefield Gulf, which is, so far as I know, the point furthest north on the coast of Greenland where this species has been observed. Nares's Expedition (see above) did not obtain any specimens. According to Collett and Malmgren it is still common in the Atlantic Ocean around Northern Spitzbergen. Amongst the specimens obtained during the Expedition the largest measures 108 millim. in length. One specimen has 12 rays in the first dorsal fin, the usual number being 10 or 11.

Icelus hamatus, Kröyer.

Icelus hamatus, H. Kröyer, *tom. cit.* p. 253; A. Günther, "Account of the Fishes collected by Capt. Feilden between 78° and 83° N. lat. during the Arctic Expedition, 1875-76," Proc. Zool. Soc. London, 1877, p. 293; R. Collett, *loc. cit.* p. 34, pl. i. fig. 8; Chr. Lütken, *Dijmphna-Togtets zoologisk-botaniske Udbytte*, p. 123 (1887).

Dr. Ohlin's collection contains no less than 101 specimens of this species, which is, perhaps, the most common and widely distributed among the arctic Cottids. The greatest number (61) are from Inglefield Gulf; of the remainder, 38 specimens were caught in Murchison's Sound and 2 in the neighbourhood of Northumberland Island. The largest specimen (a female 95 millim. in length) is from Inglefield Gulf; the smallest is 30 millim. long and from the same locality. Between these two all sizes are well represented.

The proportion of males to females is as 7 to 10.

Concerning the extension of the lateral line, Collett* says that it is often absent posteriorly, "which cannot be

accounted for by the immaturity of the individual." Lütken, in the 'Dijmphna-Togt,' makes nearly the same statement, but with the modification that the lateral line ends in very young individuals exactly above or in front of the anal fin; in other cases variation in the extension of the lateral line may be due to difference in locality.

An examination of the numerous specimens obtained during the Peary Expedition plainly indicates that the extension of the lateral line stands in an almost constant ratio to the age of the fish without regard to locality. In the smallest individuals—about 30 millim. in length—it is reduced to a few slight tubercles just in front of the anus; the lateral line is extended more backward, with very little variation, in proportion to the size of the fish, reaching to the caudal in all tolerably grown individuals. Excepting in very young individuals, the spines of the lateral line are nearly always stronger than those of the dorsal line. The lateral line begins with fully developed spines close to the upper corner of the gill-opening. The tubercles of the dorsal line appear some distance behind the commencement of the lateral line as small points that increase in size backward, and eventually become transformed into ordinary thorny spines.

Only one specimen (a small female from Inglefield Gulf) has a slight and thin row of tubercles on each side at the base of the anal; the other specimens show no trace of such an appendage. Neither has Lütken seen these spines in any of the sixty-six specimens of the 'Dijmphna-Togt.' Their occurrence may be considered exceptional, or, perhaps, restricted to certain localities, especially, according to Collett*, the Scandinavian coasts †.

Most of the specimens in this collection possess a row of tubercles behind the pectorals. In the specimens where this row is most strongly developed it runs into the lateral line close to the points of the pectorals.

* *L. c.* p. 36.

† The only Scandinavian specimen I had an opportunity of seeing is very young, and was dredged (July 1895) by Dr. Carl Aurivillius from a depth of 40-70 fathoms in Koster Bay (Northern Bohuslän). Its total length is 17 millim. No spines in the lateral line or behind the pectorals. The spines of the dorsal line are well developed and reach to the caudal; they originate on the skull, being throughout long and sharp. The foremost pair of parietal tubercles slightly marked. The upper præcercular spine simple and bent upwards. No spines along the base of the anal.

Centridermichthys uncinatus, Reinhardt.

Cottus uncinatus, T. Reinhardt, sen., Kongl. Danske Vidensk. Selsk., Naturvid. og Mathem. Afhandl. Deel 6, p. xlix.

Centridermichthys uncinatus, R. Collett, Norges Fiske, p. 31; id. The Norwegian North-Atlantic Expedition, Zoology, Fishes, p. 29, pl. i. fig. 7; Chr. Lütken, Dijnphna-Togtets zoologisk-botaniske Udbytte, p. 124.

This species is represented by six small specimens from Inglefield Gulf; the largest measures 61 millim. in length and the smallest 31 millim.

Concerning its geographical distribution, Collett* states that the species exists in a relatively southern region. In the Arctic Ocean of Europe it is not caught further to the north than in station 326 of the Norwegian North-Atlantic Expedition at 75° 31' N. lat., and Nares's Expedition did not obtain any specimen between 78° and 83° N. lat. The comparatively numerous occurrence of this species in Inglefield Gulf, between 77° and 78°, proves that it is more distributed northwards than has hitherto been supposed, although it perhaps ought to be looked for in those latitudes chiefly at a lesser depth.

Triglops Pingelii, Reinhardt.

Triglops Pingelii, T. Reinhardt, sen., loc. cit. 7de Deel, pp. 114 & 118; A Gunther, "Account of the Fishes collected during the Arctic Expedition, 1875-76," Proc. Zool. Soc. London, 1877, p. 476; R. Collett, The Norwegian North-Atlantic Expedition, 1876-78, Zoology, Fishes, p. 38, pl. i. figs. 9-10.

Only two specimens were collected during the Expedition; both are females and are not well preserved.

Northumberland Island and Inglefield Gulf.

Gasterosteus aculeatus, Linné.

Gasterosteus aculeatus, f. *hemigymnus*, R. Collett, Norges Fiske, p. 11; id. "Meddelelser om Norges Fiske i Aarene 1875-78," Christiania Vidensk. Selsk. Forhandling, 1879, no. 1, p. 1.

Thirteen small specimens were caught in "Fjären" (that part of the shore laid bare by ebb) at Godhavn; their size does not exceed 3 centim. Most of them belong to Collett's variety *hemigymnus* †, distinguished by the absence of osseous plates on the tail and on the greater part of the sides of the body, as well as by the presence of ridges on both sides

* The North-Atlantic Expedition, part iii. p. 33.

† Norges Fiske, p. 12.

of the tail. So far as I know, this form has not hitherto been noticed from Greenland.

One specimen represents Cuvier's var. *semiloricatus*.

Liparis lineatus (Lepechin).

Liparis barbatus, C. U. Ekström, Kongl. Vet.-Akad. Handl. för år 1832, p. 168, tab. v. (Stockholm).

Liparis tunicatus, T. Reinhardt, sen., Oversigt over Kongl. Danske Vidensk. Selsk. Forh. den physiske Classe, fra den 31 Maj 1832 til d. 31 Maj 1836, sid cxi.

Liparis arctica, Th. Gill, "Synopsis of the Cyclopteroids of Eastern North America," Proc. Acad. Nat. Sci. Philad. 1864, p. 191.

Liparis lineatus, R. Collett, The Norwegian North-Atlantic Expedition, 1876-78, Zoology, Fishes, p. 50.

Thirteen specimens of this *Liparis* were collected off Cape Faraday. The largest measures 100 millim. in length and much resembles Collett's variety *arcticus**. This form is of a nearly uniform greyish-brown colour, but with the ventral side somewhat lighter, and probably represents Gill's *Liparis arctica* according to Collett †. All the other specimens are considerably smaller—40 to 60 millim. long—and most nearly resemble the varieties *stellatus*, Malm, and *subfuscus*, Collett ‡, though not altogether agreeing with either.

Eumicrotremus spinosus, Fabricius.

Cyclopterus spinosus, O. Fabricius, in O. F. Müller's Zoologiæ Danicæ Prodromus, p. ix.

Eumicrotremus spinosus, Th. Gill, *tom. cit.* 1864, p. 190.

Cyclopterus spinosus, A. Günther, *tom. cit.* part ii. pp. 293 & 476.

Eumicrotremus spinosus, R. Collett, *loc. cit.* p. 47, pl. ii. fig. 13.

Twenty small specimens were obtained in Inglefield Gulf and one in Murchison's Sound. The largest is among the former and measures 45 millim. in length. Most of them are young, and the smallest is only 17 millim. long; the latter specimen and a few others not much longer are devoid of scales and without distinct rays in the first dorsal. Collett § supposes this species to be a deep-sea fish, as it has not hitherto been obtained at a less depth than 60 fathoms; but this supposition is contradicted by its abundant occurrence in Inglefield Gulf at a depth of only 25 fathoms and at the mouth of a glacial river.

* "Om Norges Fiske i Aarene 1875-78," Christiania Vidensk. Selsk. Forhandl. 1879, no. 1, p. 44.

† 'The Norwegian North-Atlantic Expedition,' p. 50.

‡ "Om Norges Fiske," &c. p. 42.

§ *L. c.* p. 48.

Gadus saida (Lepechin).

Gadus Fabricii, A. Günther, *tom. cit.* part ii. pp. 294 & 476.

Gadus saida, Chr. Lütken, *Dijmphna-Togtet*, p. 127.

A small specimen was caught off Cape Faraday, and a young *Gadus* obtained in Murchison's Sound belongs, in all probability, to the same species, though, owing to its being in a mutilated condition, it has not been possible to determine this with certainty.

Gymnelis viridis (Fabricius).

Gymnelis viridis, A. Günther, *tom. cit.* part ii. p. 294; R. Collett, *The Norwegian North-Atlantic Expedition, 1876-78, Zoology, Fishes*; Chr. Lütken, *Dijmphna-Togtets zoologisk-botaniske Udbytte*.

One specimen was collected in Murchison's Sound, and seven were caught in Inglefield Gulf; the largest was obtained in the latter locality and measures 123 millim. in length. The principal colour of this specimen when preserved in alcohol is grey; the sides of the body are marked along their whole length by regularly arranged patches, almost square and lightly marbled. Four individuals are of a nearly uniform grey; three others have a number of whitish circular spots, closely placed and generally distinctly limited. As is well known, the variability of this species is very great. With regard to the colour, Krøyer has* recorded not less than thirty-three varieties, and several others might be added.

Lycodes Lütkenii, Collett.

Lycodes reticulatus, Collett (nec Reinh.), *Forhandl. i. Vidensk. Selsk. i Christiania, 1878, no. 14, p. 59.*

Lycodes Lütkenii, Collett, *The Norwegian North-Atlantic Expedition, 1876-78, Zoology, Fishes, p. 103, pl. iii. fig. 25*; Chr. Lütken, *Dijmphna-Togtets zoologisk-botaniske Udbytte, p. 128, pl. xvi. figs. 1-6.*

A young *Lycodes* was obtained in Murchison's Sound; another somewhat larger specimen was captured in Inglefield Gulf.

With regard to the immature Lycodids, our knowledge is still very imperfect, especially as to their systematic relations. It might therefore appear rather premature to identify the specimens in question with *Lycodes Lütkenii*, Collett, the more so as this cannot with absolute certainty be considered a species distinct from *L. reticulatus*, Reinh. As to the proportions of the head and the pectorals, as well as their colour,

* *Naturhist. Tidsskrift 3dje Række, 1ste Bind (Copenhagen).*

however, both specimens closely correspond with some young Lycodids from the Kara Sea that Lütken has * identified with *L. Lütkenii*. Thus it seems safe to consider them to belong to the same species.

Below are some measurements &c. of my specimens:—

| | Specimen from Murchison's Sound. | Specimen from Inglefield Gulf. |
|--|---|---|
| Number of rays in the pectoral | 18 | 18 |
| Width of the pectoral | equals the height of the body + the dorsal. | equals the height of the body + the dorsal. |
| Length of the pectoral | 6 mm. | 8 mm. |
| Length of the tail † . . | 24 mm. | 36 mm. |
| Height of the head | equals the greatest height of the body ‡. | a little less than the greatest height of the body ‡. |
| Length of the head . . | 10.5 mm. | 14 mm. |
| Total length | 44 mm. | 56 mm. |

As will appear by this list, the length of the head is about one fourth of the total length, and the length of the pectorals is about one seventh of the total length; in both specimens the tail was a little more than half of the total length.

Lütken mentions the length of the head in the specimens from the Kara Sea as about one fourth, and that of the pectorals little less than one seventh, of the total length. The tail, measured from the anus to the end of the caudal, is in the same individuals very little more than half the length of the body, although with a slight variation. According to Lütken, the proportion of the tail affords a characteristic difference between *L. Lütkenii* and *L. reticulatus*, Reinh. In Collett's type specimens, however, the tail is comparatively longer than in the specimens from the Kara Sea, at least if we judge by the figures. In the *Lycodes* from Inglefield Gulf the tail is a little longer than it is depicted in Collett's figures; but, considering the usual variability of the tail in long-tailed fishes, the peculiarity just referred to cannot prevent us from identifying that specimen also with *L. Lütkenii*. For the same reason the length of the tail cannot be considered a valid characteristic. The exceptional size of the pectorals, which in more mature specimens are broader than the body is high, is, without doubt, the safest criterion (Collett's type

* *L. c.*

† Measured from the anus to the point of the caudal.

‡ Without the dorsal.

specimens). In Collett's specimens the pectorals have 23 rays; in Lütken's they have 16-18, in rare cases 19 rays. The variation is accounted for by Lütken as dependent on difference of age. As I have already stated, my specimens have 18 rays, although they are very young. In both specimens the width of the head is greater than that of the body and equal to the length of the pectorals. The eyes are situated much nearer the snout than the neck. The ventrals lie exactly on the line that is supposed to connect the gill-openings at their base. Both individuals are devoid of scales. The mucous membrane of the mouth is white.

The smaller specimen (from Murchison's Sound) is nearly identical with Lütken's fig. 5 in the '*Dijmphna-Togt*' with regard to both shape and colour. In both specimens the sides of the body and the dorsal are marked with irregular square spots with blackish margins. These spots are smaller and more numerous in the smaller specimen, which is much paler both in prevailing colour and marks.

Lund, Sweden,
May 1895.

XXXIV.—*Note on the Water-Voles of Bosnia, Asia Minor, and Western Persia.* By G. E. H. BARRETT-HAMILTON.

IN looking over the specimens of Water-Voles preserved in the British Museum collection I find examples of two forms from Bosnia and Asia Minor which I am unable to associate with any of the known subspecies found in Western Europe, and one of which at least seems to me to have been hitherto undescribed.

The Water-Voles of Western Europe, as is well known, have been the subject of a good deal of species-making, and our knowledge of the synonymy and relations of the various local races or subspecies is at present in a rather confused condition. My friend Mr. Gerrit S. Miller, Junior, Assistant Curator of Mammals at Washington, whose masterly paper "On the Genera and Subgenera of Voles and Lemmings" * has already cleared away so many difficulties, has, in addition, imposed upon himself the task of unravelling the tangle which surrounds the subgenus *Arvicola*, Lacépède, to which the Water-Voles belong. As I do not wish to anticipate anything

* U.S. Department Agriculture (Div. of Orn. & Mamm.): North-American Fauna, no. 12 (July 23, 1896).